Log Event A

Borehole # 20-00-07

Borehole Information

Farm : B	**Tank :** B	**Site Number :** 299-E33-56
N-Coord : 45,177	**W-Coord :** 52,853	**TOC Elevation :** 656.20
Water Level, ft :	**Date Drilled :** 12/31/1944	

Casing Record

Type : Steel-welded	Thickness, in. : 0.406	ID, in. : 12
Top Depth, ft. : 0	Bottom Depth, ft. : 50	
Type : Steel-welded	Thickness, in. : 0.365	ID, in. : 10
Top Depth, ft. : 0	Bottom Depth, ft. : 150	

Borehole Notes:

Borehole 20-00-07 was drilled in December 1944 to a total depth of 150 ft. Data from the drilling log and Chamness and Merz (1993) were used to provide borehole construction information. The borehole was initiated with 12-in. casing, which was driven to a depth of 50 ft. A 10-in. casing was installed inside the 12-in. casing and driven to a depth of 150 ft. The drilling log reports that the 10-in. casing was perforated from 48 to 148 ft and that the bottom of the 10-in. casing was sealed with half a sack of cement. The thicknesses of the 12-in. and 10-in. casings are presumed to be 0.406 in. and 0.365 in., respectively, on the basis of the published thickness for schedule-40, 12-in. and 10-in. steel tubing.

Equipment Information

Logging System : 2B	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 11/97	**Calibration Reference :** GJO-HAN-20	**Logging Procedure :** MAC-VZCP 1.7.10-1

Logging Information

Log Run Number :	1	**Log Run Date :**	11/20/1998	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	76.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	28.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	2	**Log Run Date :**	11/23/1998	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	0.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	29.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

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Log Run Number :	3	**Log Run Date :**	11/23/1998	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	65.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	50.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Logging Operation Notes:

This borehole was logged by the SGLS in three log runs. Two log runs were required to log the borehole. An additional log run was performed to repeat an interval of the borehole as a quality check.

The top of the borehole casing, which is the zero reference for the SGLS, is approximately even with the ground surface. The total logging depth achieved was 76.0 ft.

Analysis Information

Analyst : Eric Larsen

Data Processing Reference : MAC-VZCP 1.7.9 Analysis Date : 03/12/1999

Analysis Notes :

The pre-survey and post-survey field verification for each logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the accepted calibration spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

This borehole is double-cased with 10-in.- and 12-in.-diameter casings from the ground surface to 50 ft and single-cased with 10-in.-diameter casing from 50 ft to total depth. A casing correction factor for a 0.65-in.-thick steel casing was applied to the concentration data collected from 0 to 50 ft because it most closely matches the 0.771 in. total combined thickness of the double casing. A casing correction factor for a 0.365-in.-thick steel casing was applied to the concentration data collected from 50 ft to the bottom of the borehole.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

The interval between 50 and 65 ft was relogged as a quality assurance measure to establish the repeatability of the radionuclide concentration measurements. A separate log plot showing the radionuclide concentrations that were calculated using separate data sets provided by the original and rerun logging runs is included.

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Results/Interpretations:

The man-made radionuclide Cs-137 was detected around this borehole. The Cs-137 contamination was measured nearly continuously from the ground surface to 8 ft. A few isolated occurrences of Cs-137 contamination were detected between 18 and 60.5 ft. A small zone of nearly continuous Cs-137 was detected from 64.5 to 68.5 ft.

The K-40 concentrations increase from 37.5 to 40.5 ft. Sharply decreased K-40 concentrations occur from 50 to 51 ft. Relatively decreased U-238 and Th-232 concentrations occur at a depth of about 50 ft.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank B-110.